

IR Speed Dome Installation Manual

V2.0.0

Thank you for purchasing our product. If there are any questions, or requests, please do not hesitate to contact the dealer.

This manual applies to **IR Speed Dome**.

This manual may contain several technical incorrect places or printing errors, and the content is subject to change without notice. The updates will be added to the new version of this manual. We will readily improve or update the products or procedures described in the manual.

DISCLAIMER STATEMENT

“Underwriters Laboratories Inc. (“UL”) has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested for fire, shock or casualty hazards as outlined in UL’s Standard(s) for Safety, UL60950-1. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product. UL MAKES NO REPRESENTATIONS, WARRANTIES OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING RELATED FUNCTIONS OF THIS PRODUCT.”

Safety Instruction

These instructions are intended to ensure that the user can use the product correctly to avoid danger or property loss.

The precaution measure is divided into 'Warnings' and 'Cautions':

Warnings: Serious injury or death may be caused if any of these warnings are neglected.

Cautions: Injury or equipment damage may be caused if any of these cautions are neglected.

	
Warnings Follow these safeguards to prevent serious injury or death.	Cautions Follow these precautions to prevent potential injury or material damage.



Warnings

1. In the use of the product, you must strictly comply with the electrical safety regulations of the nation and region.
2. Please use the power adapter which is provided by normal company. The adapter should be either AC 24V/3A or DC 12V/5A according to different dome models.
3. Do not connect several devices to one power adapter as an adapter overload may cause over-heating and can be a fire hazard.
4. Please make sure that the power has been disconnected before you wire, install or dismantle the speed dome.
5. When the product is installed on a wall or ceiling, the device should be firmly fixed.
6. If smoke, odor, or noise rise from the device, turn off the power at once and unplug the power cable, then contact the service center.
7. If the product does not work properly, please contact your dealer or the nearest service center. Never attempt to disassemble the camera yourself. (We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.)



Cautions

1. Do not drop the dome or subject it to physical shock, and do not expose it to high electromagnetism radiation. Avoid the equipment installation on vibrations surface or places subject to shock (ignorance can cause equipment damage).
2. Do not place the dome in extremely hot, cold (the operating temperature shall be -30°C ~ +65°C), dusty or damp locations, or fire or electrical shock will occur otherwise.
3. The dome cover for indoor use shall be kept from rain and moisture.
4. Exposing the equipment to direct sun light, low ventilation or heat source such as heater or radiator is forbidden (ignorance can cause fire danger).
5. Do not aim the camera at the sun or extra bright places. A blooming or smear may occur otherwise (which is not a malfunction however), and affecting the endurance of CCD at the same time.
6. Please use the provided glove when open up the dome cover, avoid direct contact with the dome cover, because the acidic sweat of the fingers may erode the surface coating of the dome cover.
7. Please use a soft and dry cloth when clean inside and outside surfaces of the dome cover, not to use alkaline detergents.
8. Do not stare at infrared lights closely to avoid hurting your eyes when the infrared lights are on.
9. Improper use or replacement of the battery may result in hazard of explosion. Replace with the same or equivalent type only. Dispose of used batteries according to the instructions provided by the battery manufacturer.

Preparation for Installation

1. Basic requirements

- 1) All the electronic operation should be strict compliance with the local electrical safety regulations, fire prevention regulations and other related regulations at the installation place.
- 2) Check whether all the accessories are there according to the packing list, make sure that the place and installation mode are conform to the demands, if not, please contact the supplier.
- 3) Please use this product according to the working environment.

2. Check installation space.

Make sure the place have enough space to install the speed domes and its accessories.

3. Check the intensity of conformation at the installation scene.

Please make sure that the endure ability of ceilings or walls is 4 times as the weight of speed dome and its accessories.

4. Preparation of cables

- Choose the video cable according to the transmission length. The video should meet the least demands as:
 1. 75Ω resistance
 2. 100% copper core conducting wire.
 3. 95% weaving copper shield.
- RS485 communication cable, please refer to Appendix 2
- 24V AC power cable, please refer to Appendix 3

5. Please keep all wrappers

Please keep all wrappers after unpack them for future use. In case of any failure occurred, please return the speed dome to the factory with the original wrapper.

Note: Transportation without the original wrapper may result in damage on the speed dome and cost additional charge.

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Chapter 1 Installation

1.1 Check Parts List

Prior to installation, unpack the dome unit and check whether it is in good condition and all parts and accessories are included by referring to the packing list.

Note: The power supply for the speed dome is AC24V/3A.

1.2 IR Speed Dome and Network IR Speed Dome Installation

Note: The following installation instructions are applicable to IR speed dome, network IR speed dome and network high-definition IR speed dome models.

1. Install the dome mount. Please refer to the related sections from *Chapter2* to *Chapter5* for specific installation methods of different mounts.
2. Taking the wall mounting application for example, mount the fast mounting adapter and top cover of the IR speed dome to the wall mount. Pass the integrated cable through the wall mount firstly and then through the top cover.

(1) The fast mounting adapter is shown below:

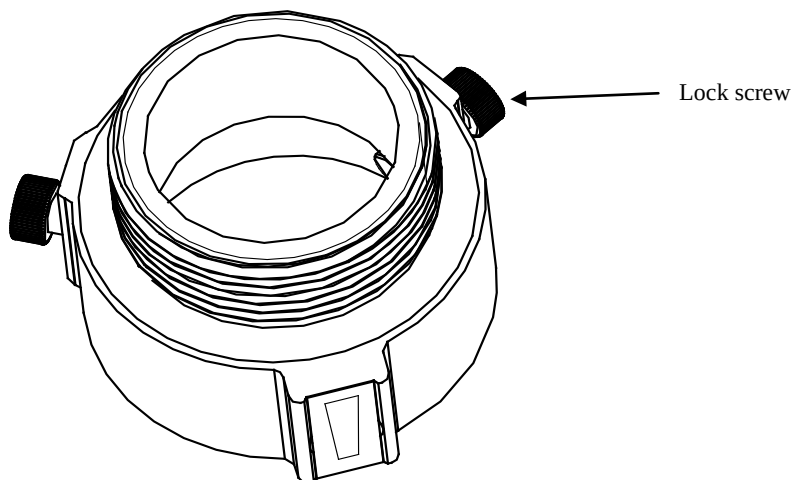


Figure 1.2.1 Fast mounting adapter

- (2) Wrap the thread compound to the thread of fast mounting adapter and screw the thread into the wall mount. Then, wedge the set screw to the wall mount as shown in figure 1.2.2.

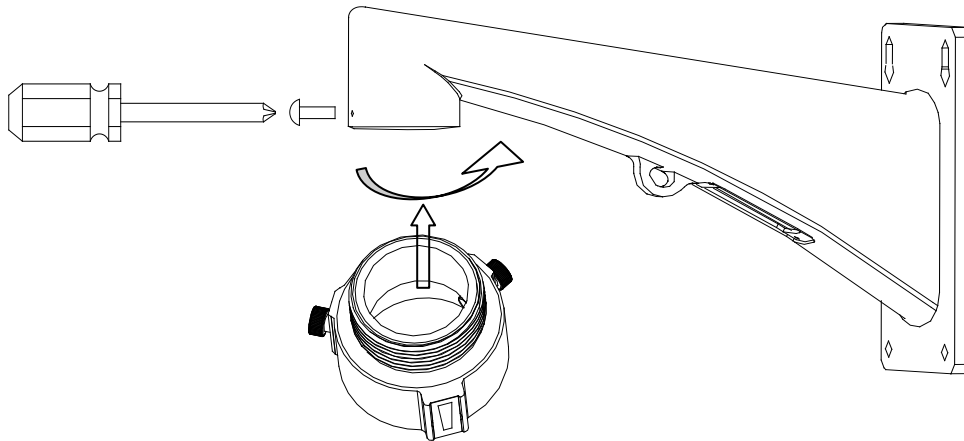


Figure 1.2.2 Install the fast mounting adapter

(3) Before installing the top cover of speed dome, please make sure that both of the lock screws on the fast mounting adapter are slack. Then screw the top cover to the fast mounting adapter and screw up the lock screws by using the L shaped socket screw hexagon wrench.

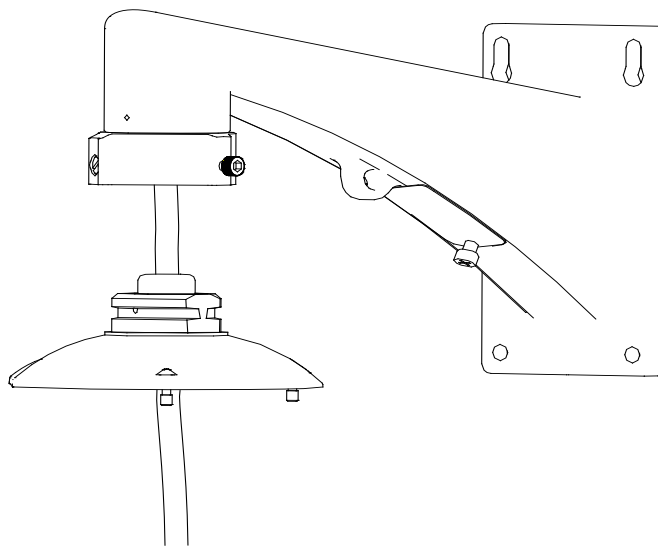


Figure 1.2.3 Install the top cover of the dome

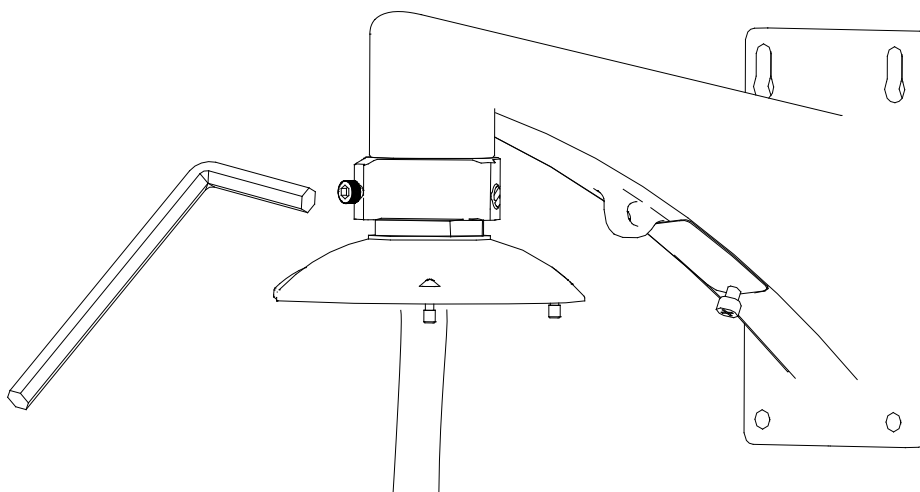


Figure 1.2.4 Screw up the lock screws

3. Take out the speed dome and tear off the protective sticker from it, as shown in figure 1.2.5. Configure the address, baud rate and other parameters through DIP switch SW1 and SW2 located on the bottom board of the dome, as shown in Figure 1.2.3(the bottom board of IR speed dome), Figure 1.2.4(the bottom board of network IR speed dome) and Figure 1.2.5(the bottom board of network high-definition IR speed dome). Please refer to *Section 1.4 DIP Switch Settings* for specific settings about address, baud rate, communication protocol, etc.

Note: There is only the matched resistance DIP switch of RS-485 on the bottom board of network high-definition IR speed dome. The RS-485 parameter of network high-definition IR speed dome should be configured in the OSD menu or on 'Remote Settings' page in the client software.

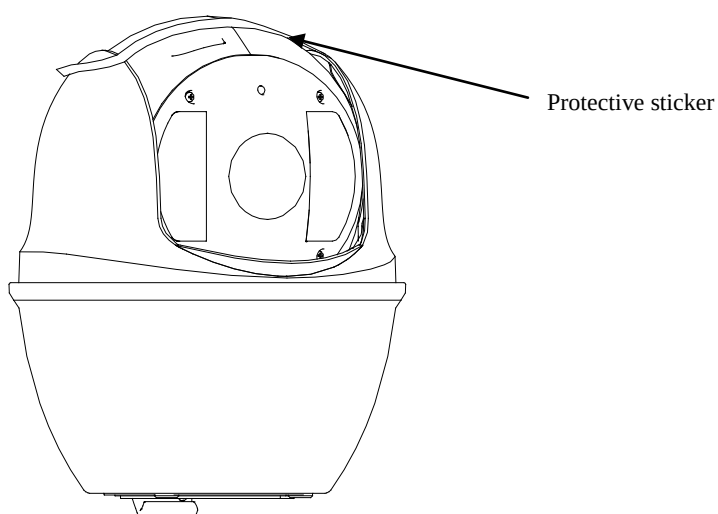


Figure 1.2.5 Tear off the protective sticker

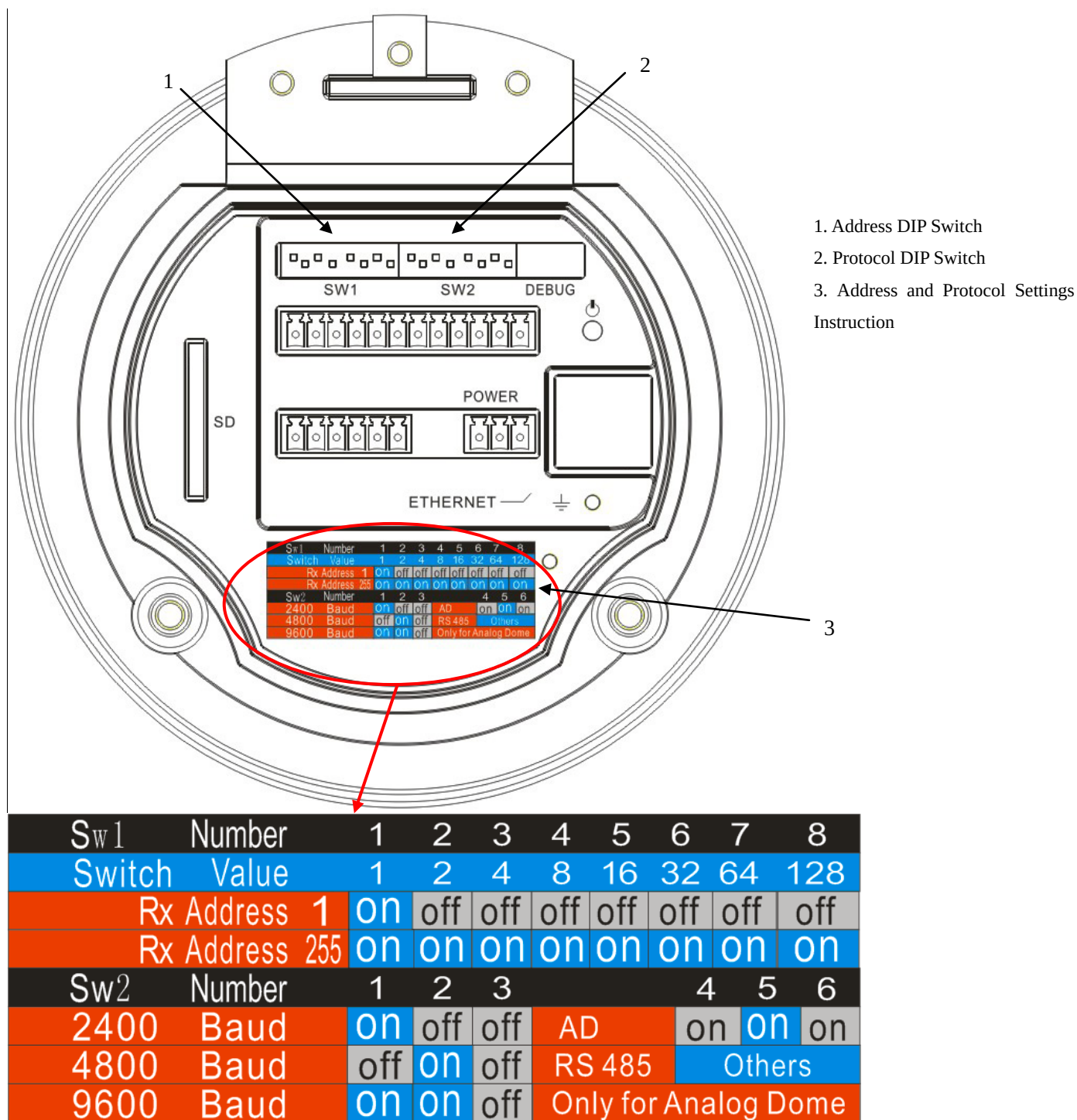
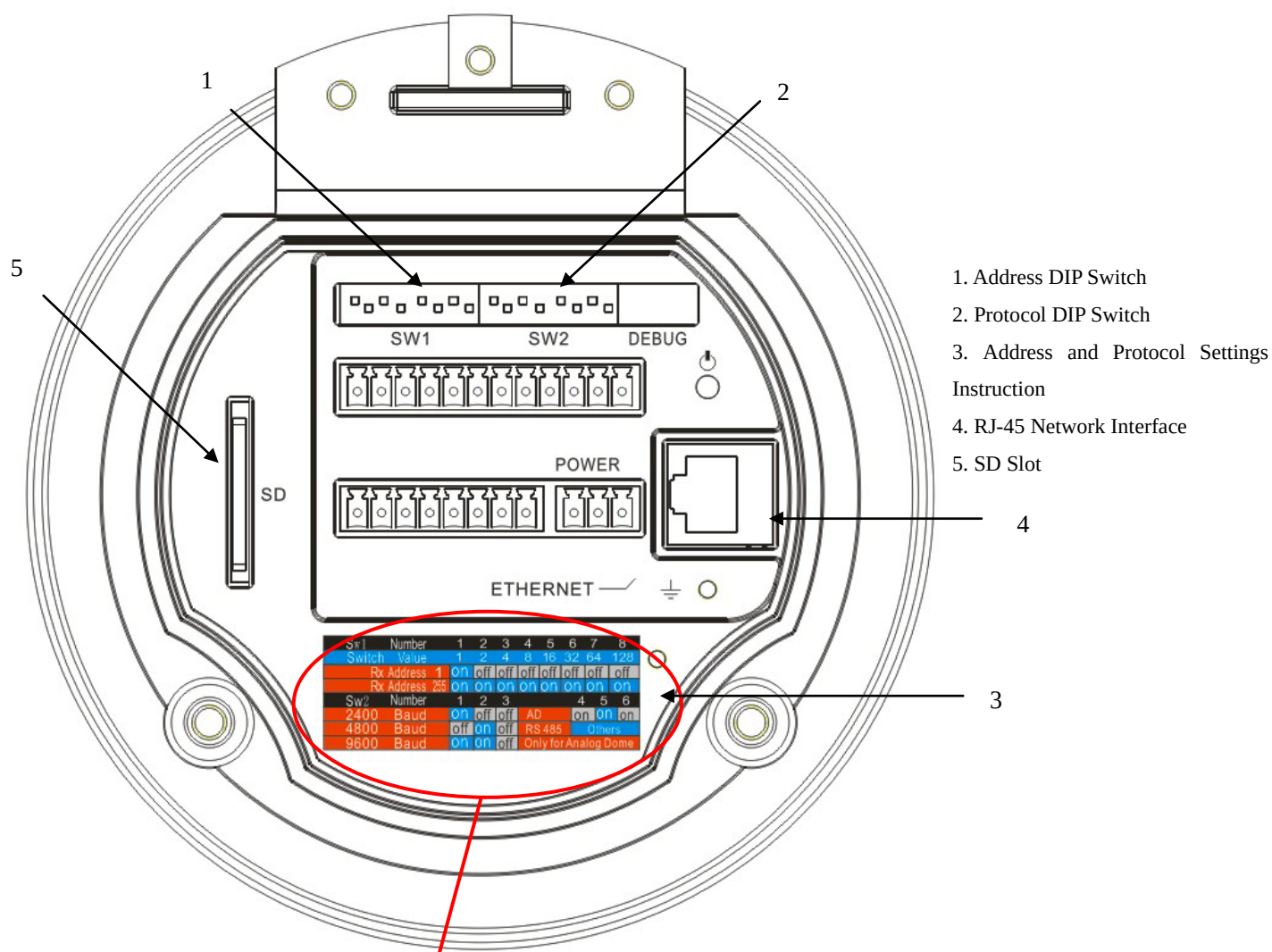


Figure. 1.2.6 Bottom board of IR speed dome



Sw1	Number	1	2	3	4	5	6	7	8	
Switch	Value	1	2	4	8	16	32	64	128	
	Rx Address 1	on	off	off	off	off	off	off	off	
	Rx Address 255	on	on	on	on	on	on	on	on	
Sw2	Number	1	2	3				4	5	6
2400	Baud	on	off	off	AD		on	on	on	
4800	Baud	off	on	off	RS 485		Others			
9600	Baud	on	on	off	Only for Analog Dome					

Figure. 1.2.7 Bottom board of network IR speed dome

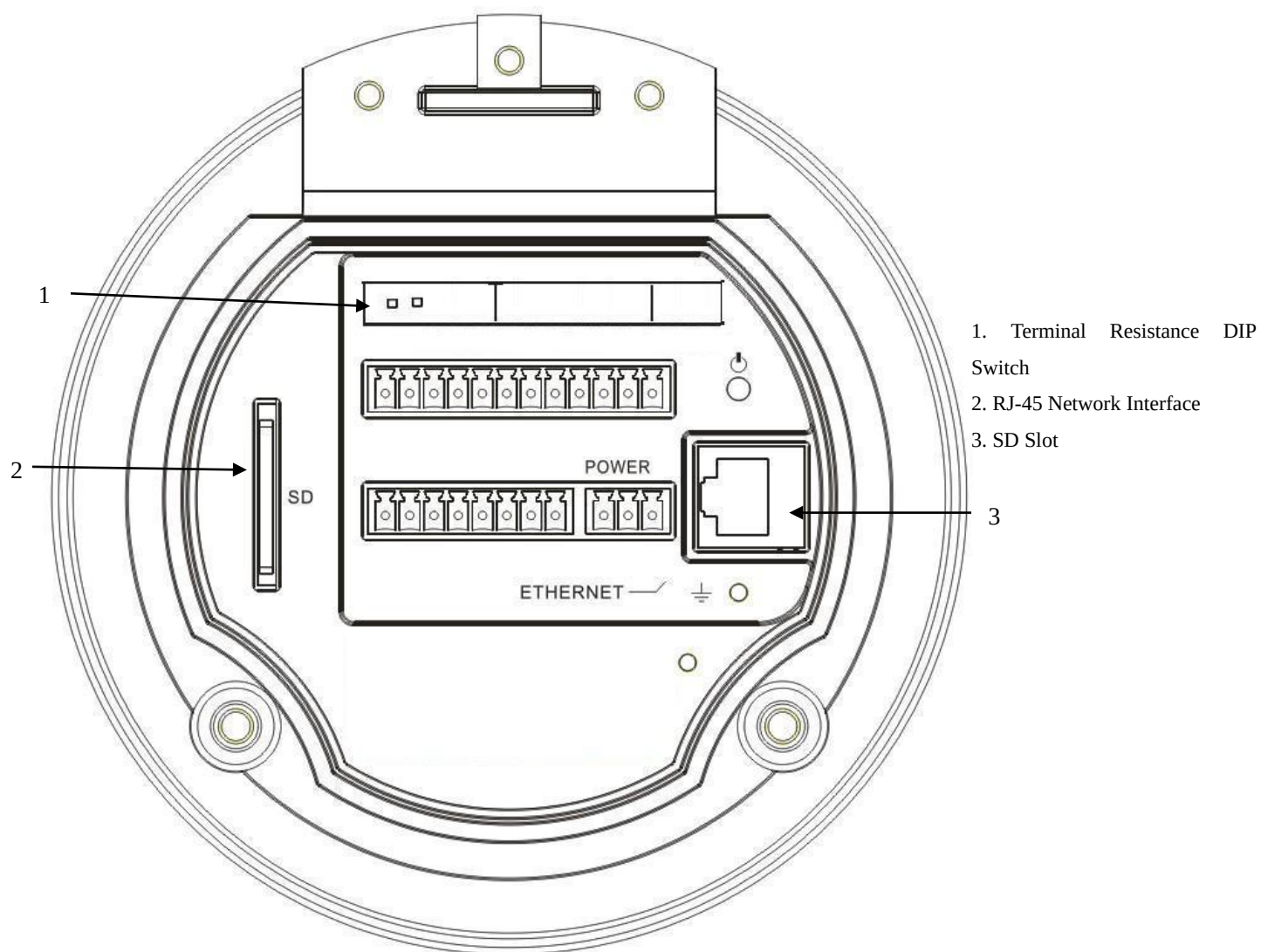


Figure. 1.2.8 Bottom board of network high-definition IR speed dome

4. Cover the sealing ring and tie the safety lanyard to the dome.

Note: The sealing ring must be set for the dome's waterproofing.



Figure. 1.2.9 Cover the sealing ring

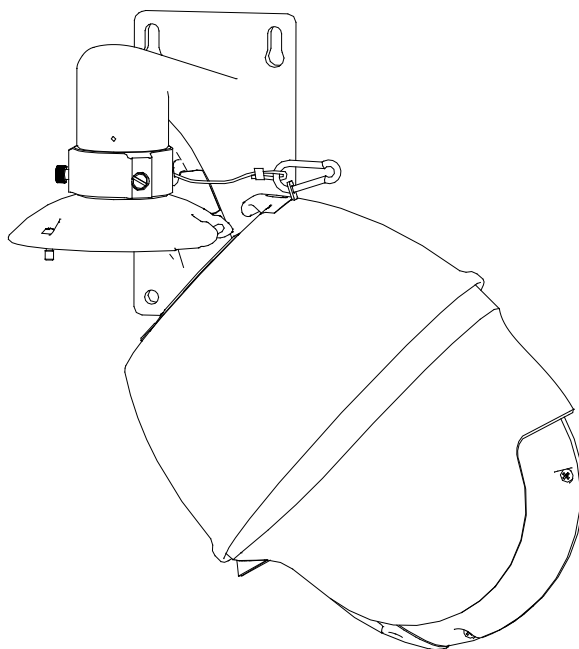


Figure. 1.2.10 Tie the safety lanyard

5. Hang the IR speed dome's hanging hook to the top cover. Then, connect the integrated cable into the appropriate slots by suggestive identifying information near the slots. The circuit interfaces on the bottom board are shown in figure 1.2.12(the bottom board of IR speed dome), 1.2.13(the bottom board of network IR speed dome), 1.2.14(the bottom board of network high-definition IR speed dome).

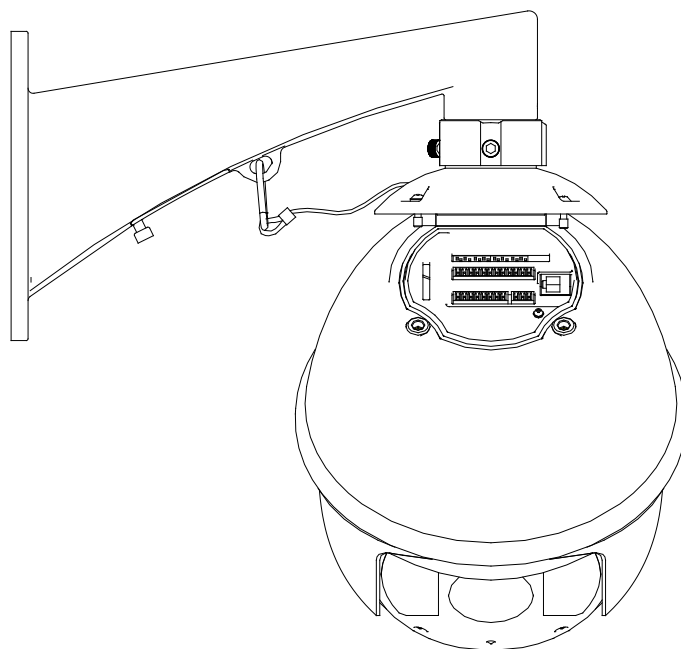


Figure. 1.2.11 Hang the dome to the top cover

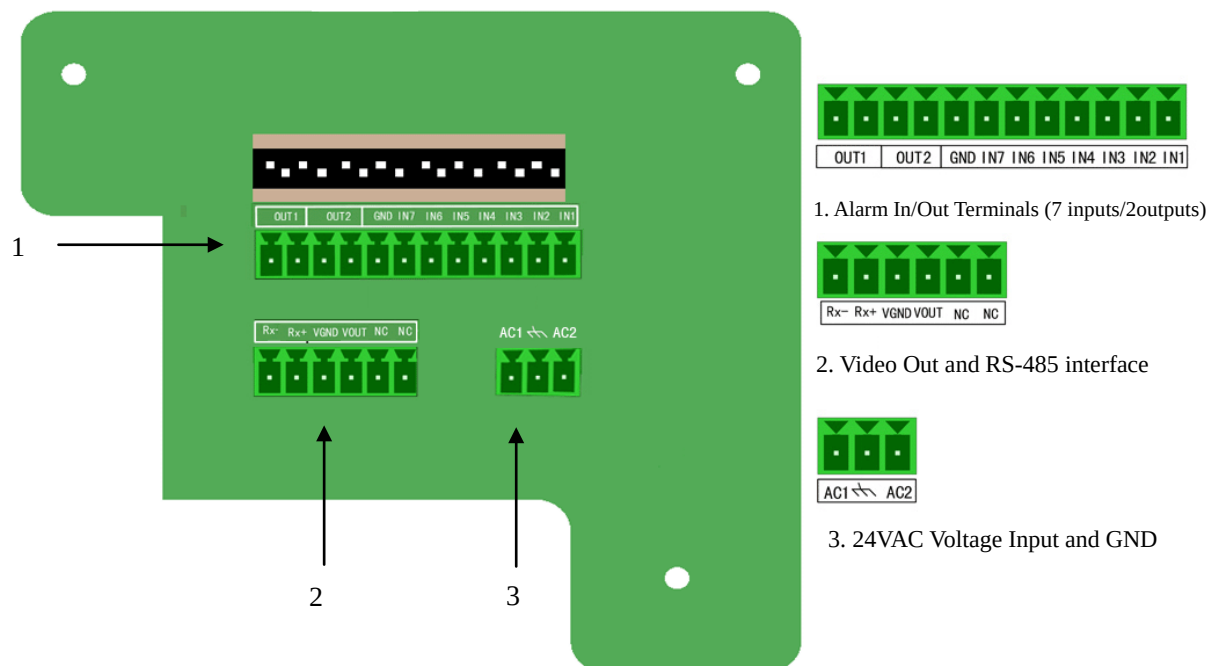


Figure. 1.2.12 Bottom circuit board (IR speed dome)

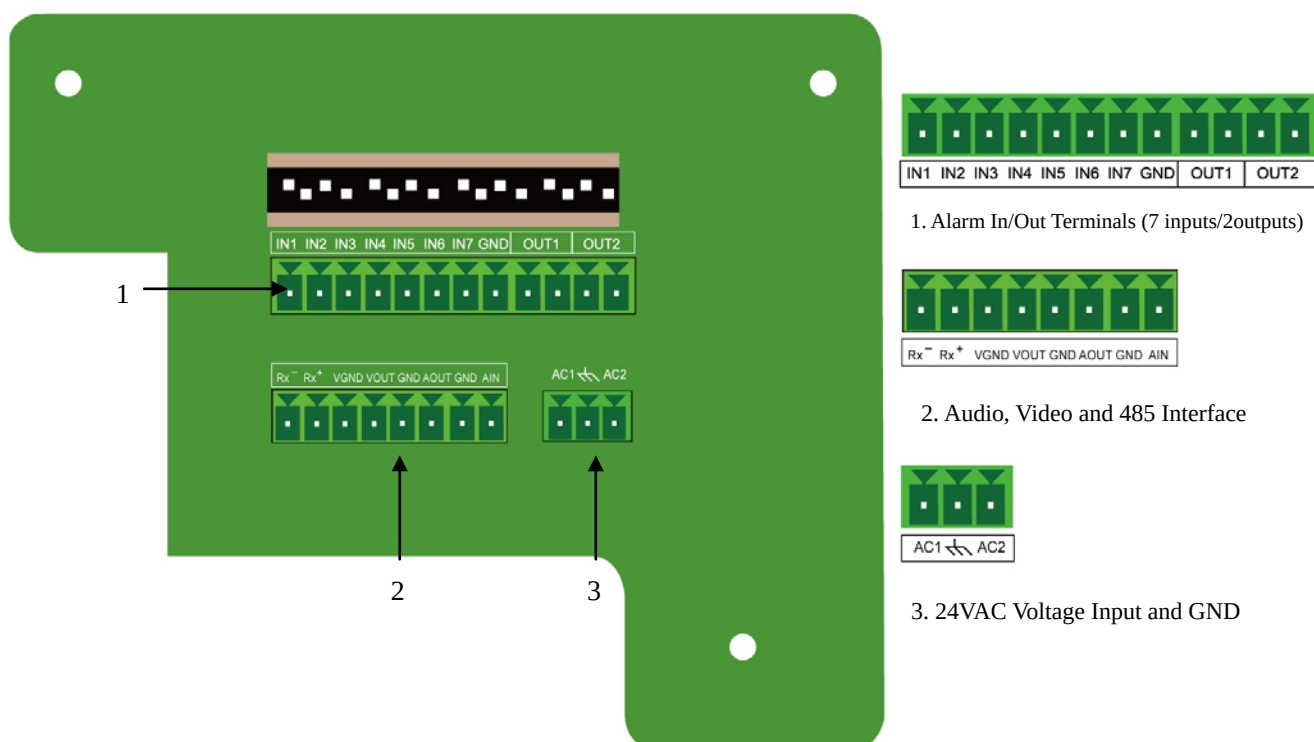


Figure. 1.2.13 Bottom circuit board (network IR speed dome)

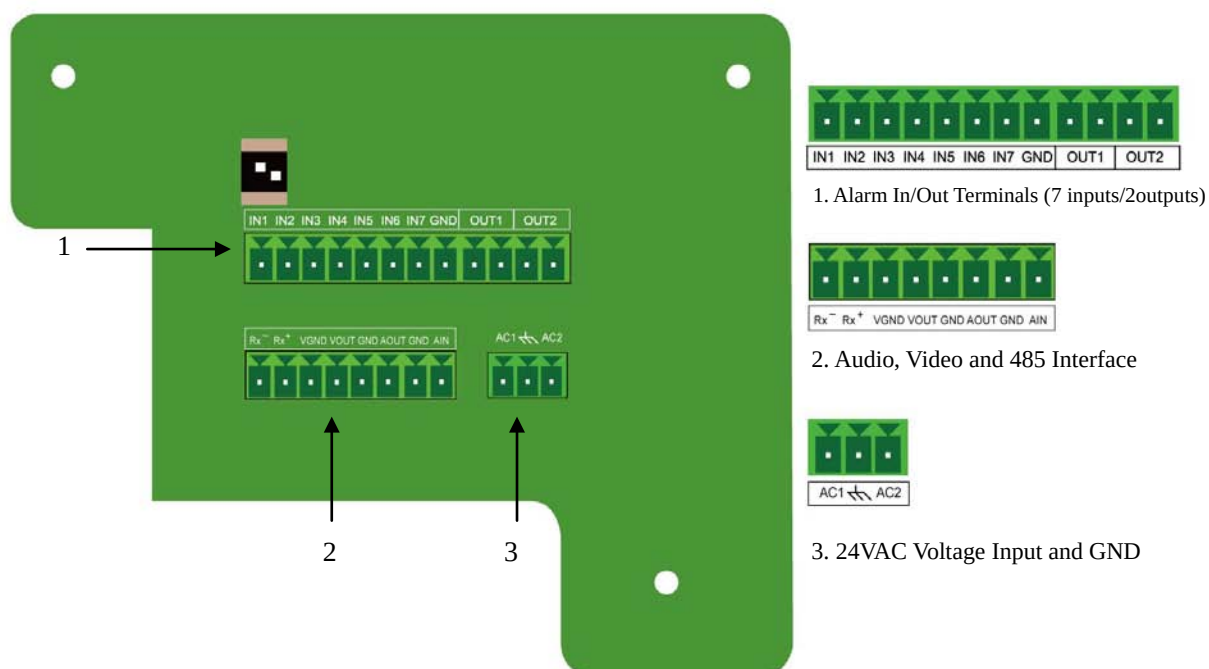


Figure. 1.2.14 Bottom circuit board (network high-definition IR speed dome)

6. Fasten the set screws to fix the IR speed dome.

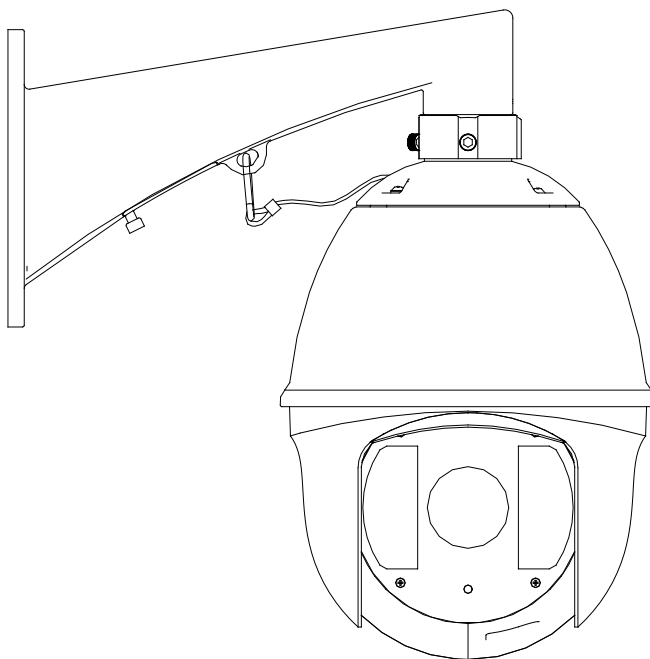


Figure. 1.2.10 Fix the IR Speed Dome

1.3 Initial Settings

Address code: 0

Baud rate: 2400

120 Ω matched resistance: OFF

1.4 DIP Switch Settings

Note: The parameters of 485 serial port of network high-definition IR speed dome must be configured in OSD menu, on 'Remote Setting' page through client software or in 'Remote Setting' page through IE browser.

1.4.1 DIP Switch Settings for IR Speed Dome and Network IR Speed Dome

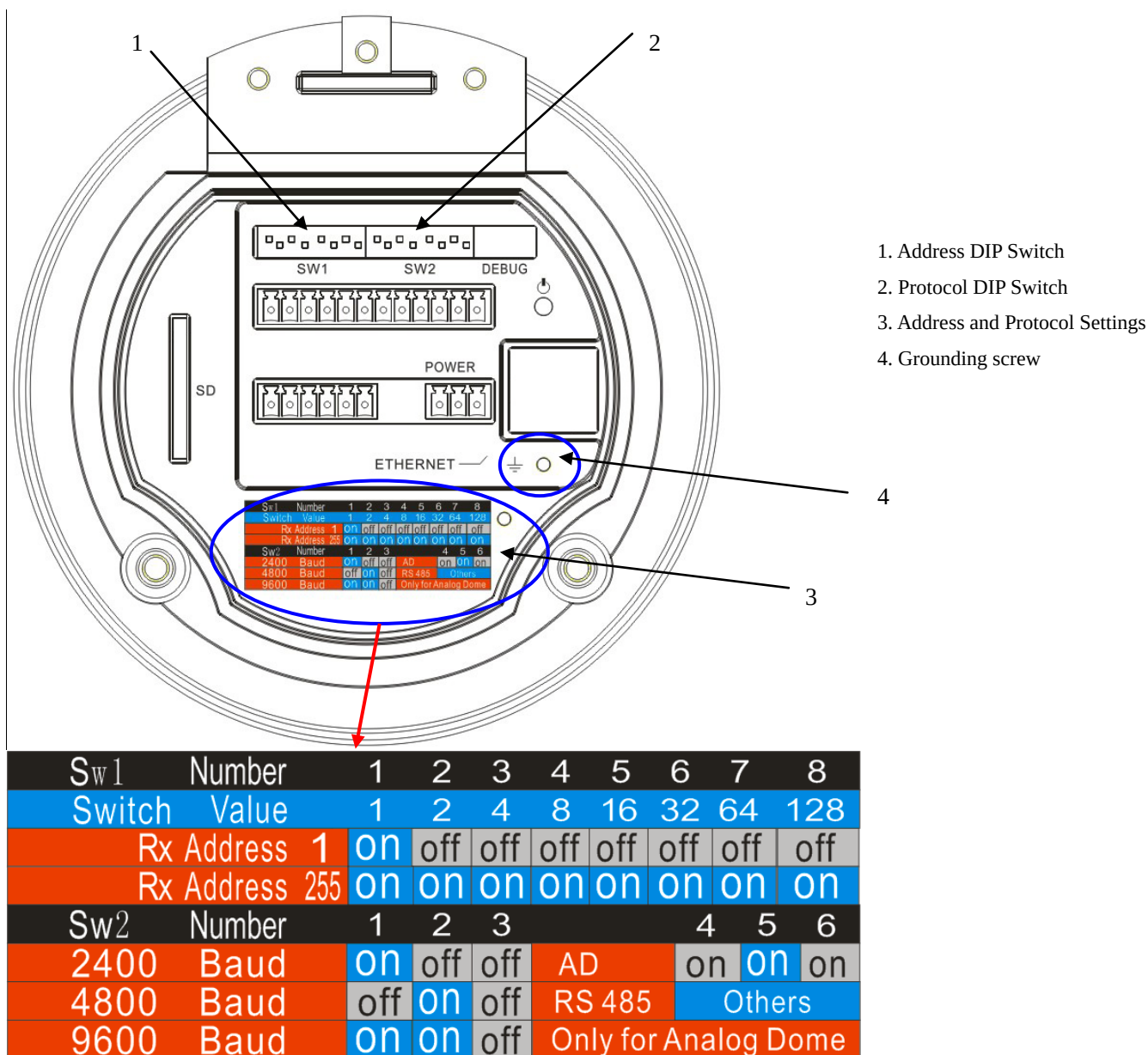


Figure. 1.4.1 Bottom board of IR speed dome

The dome provides two DIP switches SW1 and SW2 for setting the dome address, baud rate, protocol, etc (As shown in Figure 1.4.1, ON=1, OFF=0). In SW1 and SW2, 1 is the lowest position and 8 is the highest position.

Note: As the IR speed dome is capable of being self-adaptive to PELCO-D, PELCO-P, HIK-Code, VICON and KALATEL-32 protocols, and the network IR speed dome is self-adaptive to PELCO-P, PELCO-D and HIK-Code protocols as well, so, there are no

DIP switch settings needed for setting control protocol.

Note: If the dome is subject to electromagnetic interference, please remove the grounding screw to disconnect the inner circuit board from the metal case. Initially, the grounding screw is installed acquiescently, so the inner circuit board and the metal case are connected with each other.

1.4.2 Address Settings

The DIP Switch SW1 is used for setting the dome address:

Dome Address	SW1 Settings	1	2	3	4	5	6	7	8
0	SW1 	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	SW1 	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
255	SW1 	ON	ON	ON	ON	ON	ON	ON	ON

Settings for address 0~71 are listed as below:

SW1 Position Address	DIP Switch SW1 Settings							
	1	2	3	4	5	6	7	8
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
23	ON	ON	ON	OFF	ON	OFF	OFF	OFF
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
26	OFF	ON	OFF	ON	ON	OFF	OFF	OFF

27	ON	ON	OFF	ON	ON	OFF	OFF	OFF
28	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
29	ON	OFF	ON	ON	ON	OFF	OFF	OFF
30	OFF	ON	ON	ON	ON	OFF	OFF	OFF
31	ON	ON	ON	ON	ON	OFF	OFF	OFF
32	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
33	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
34	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
35	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
37	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
38	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
39	ON	ON	ON	OFF	OFF	ON	OFF	OFF
40	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
41	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
42	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
43	ON	ON	OFF	ON	OFF	ON	OFF	OFF
44	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
45	ON	OFF	ON	ON	OFF	ON	OFF	OFF
46	OFF	ON	ON	ON	OFF	ON	OFF	OFF
47	ON	ON	ON	ON	OFF	ON	OFF	OFF
48	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
49	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
50	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
51	ON	ON	OFF	OFF	ON	ON	OFF	OFF
52	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
53	ON	OFF	ON	OFF	ON	ON	OFF	OFF
54	OFF	ON	ON	OFF	ON	ON	OFF	OFF
55	ON	ON	ON	OFF	ON	ON	OFF	OFF
56	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
57	ON	OFF	OFF	ON	ON	ON	OFF	OFF
58	OFF	ON	OFF	ON	ON	ON	OFF	OFF
59	ON	ON	OFF	ON	ON	ON	OFF	OFF
60	OFF	OFF	ON	ON	ON	ON	OFF	OFF
61	ON	OFF	ON	ON	ON	ON	OFF	OFF
62	OFF	ON	ON	ON	ON	ON	OFF	OFF
63	ON	ON	ON	ON	ON	ON	OFF	OFF
64	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
65	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
66	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
67	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
68	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
69	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
70	OFF	ON	ON	OFF	OFF	OFF	ON	OFF

71	ON	ON	ON	OFF	OFF	OFF	ON	OFF
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1.4.3 Baud Rate Settings

The positions 1-3 of the DIP Switch SW2 are used for setting the baud rate of the dome. The values are 100, 010, 110, respectively representing 2400bps, 4800bps, 9600bps. If the baud rate is out of the above range, it will be the default setting, 2400bps. Refer to the following table:

DIP Switch SW2-Baud Rate Settings					
Baud Rate	Positions1-3 Settings	1	2	3	
2400	SW2 	ON	OFF	OFF	
4800	SW2 	OFF	ON	OFF	
9600	SW2 	ON	ON	OFF	

1.4.4 Protocol Settings

The positions 4-6 of the DIP Switch SW2 are used for setting the communication protocols of the dome. Refer to the following table (network speed dome model does not support Manchester code protocol):

DIP Switch SW2-Protocol Settings					
Protocol	Positions 4-6 Settings	4	5	6	
Bosch Manchester	SW2 	OFF	ON	ON	
AD Manchester	SW2 	ON	ON	ON	
Self-adaptive	Others				

1.4.5 Simplex/Half-duplex Settings

The position 7 of the DIP Switch SW2 is used for setting the communication method of the dome to simplex or half-duplex.

DIP Switch SW2-Simplex/Half-duplex Settings		
Description	Position 7 Setting	7
Simplex	SW2 	OFF
Half-duplex	SW2 	ON

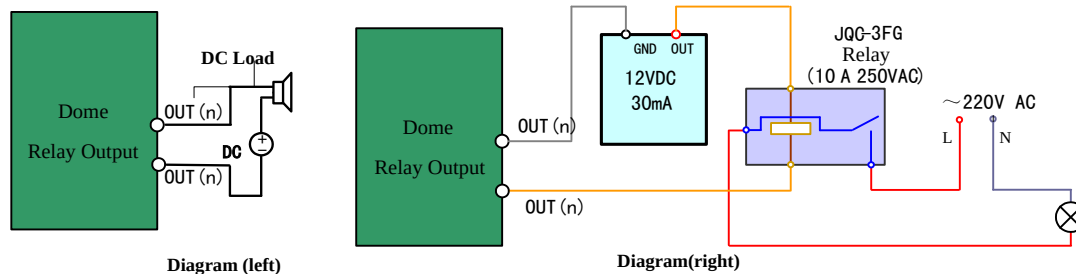
1.4.6 Terminal Matched Resistance Settings

The position 8 of the DIP Switch SW2 is used for setting the terminal matched resistance of the dome.

DIP Switch SW2-Terminal Matched Resistance Settings		
Description	Position 8 Setting	8
Not Terminated	SW2 	OFF
Terminated	SW2 	ON

1.5 Alarm In/Out Connections

The IR speed dome, network IR speed dome can be connected with 7 alarm inputs (0~12VDC) and 2 alarm outputs. Refer to the following diagrams:



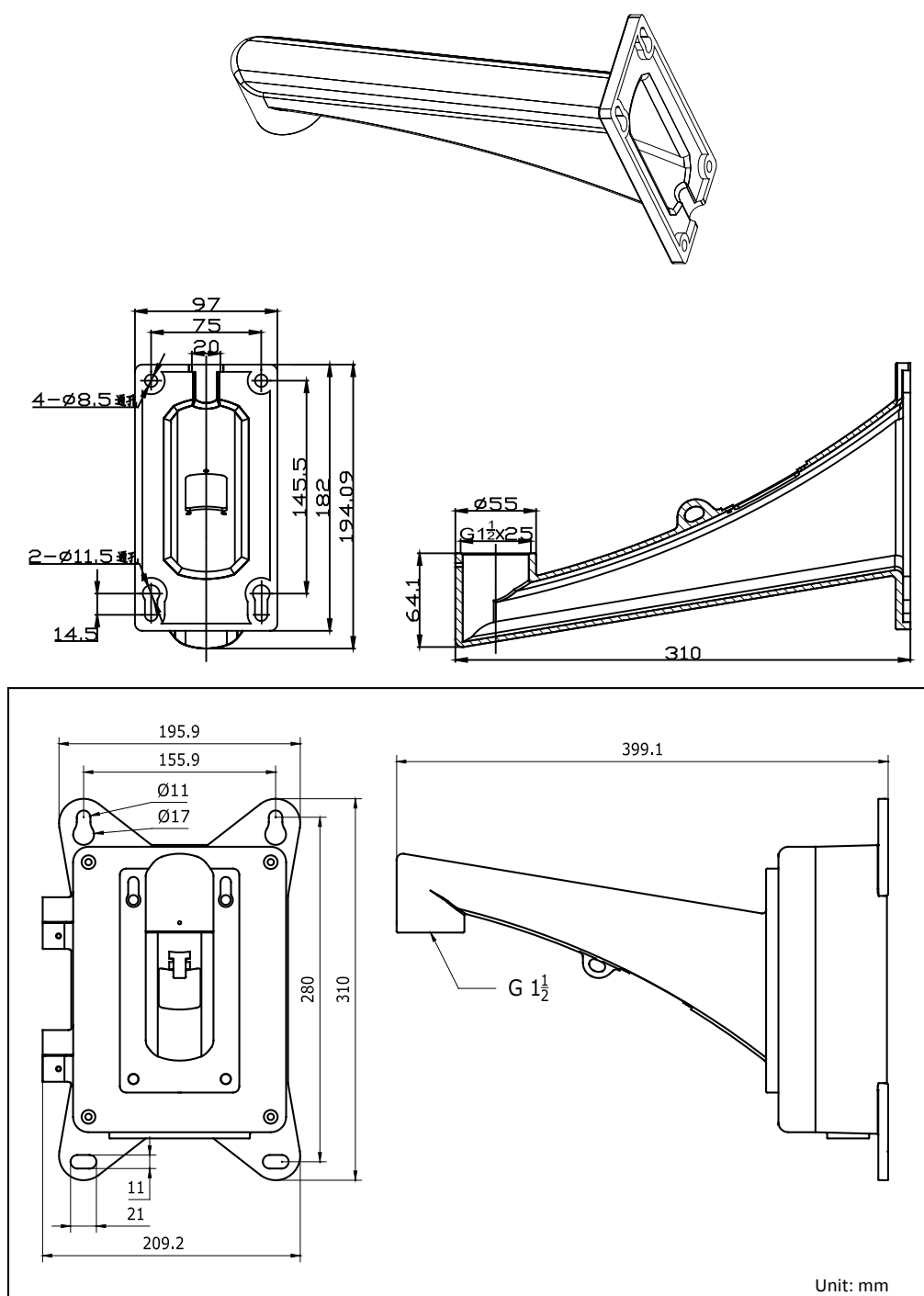
The alarm provides the relay output (no voltage), and the external power supply is required when it connects to the alarm device. For DC power supply (left diagram), the input voltage must be within the range of 12VDC, 30mA. For AC power supply, the external relay must be used (right diagram) so as to prevent damages to the unit and avoid risk of an electric shock.

1.6 Power Cable Explanation

Under the situation of standard AC power supply of speed dome, the relation between cross-sectional($S(\text{mm}^2)$) area of bare cable for IR speed dome and the maximum transmission distance ($L(\text{m})$) of bare cable for IR speed dome should be $L = 50 * S$; And $L = 40 * S$ for network IR speed dome. For example, when bare cable's cross-sectional is 1mm^2 , the distance for transmission should not exceed 50m for IR speed dome and 40m for network IR speed dome. Please refer to 'Appendix 3 Table of Wire Gauge Standards' for the American or Britain's wire gauge. For example, when the American wire gauge is 18, the recommended distance should be $0.7854 * 50 = 39.27\text{m}$.

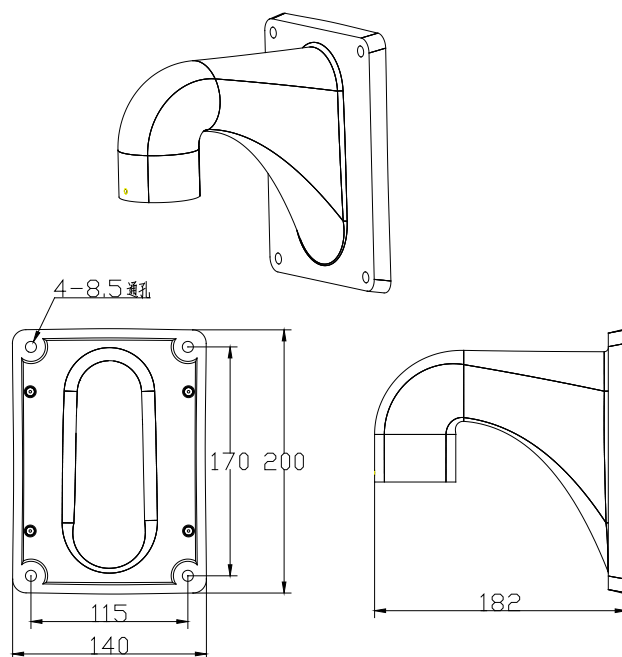
Chapter 2 Mounts Dimension

2.1 Long Wall Mount

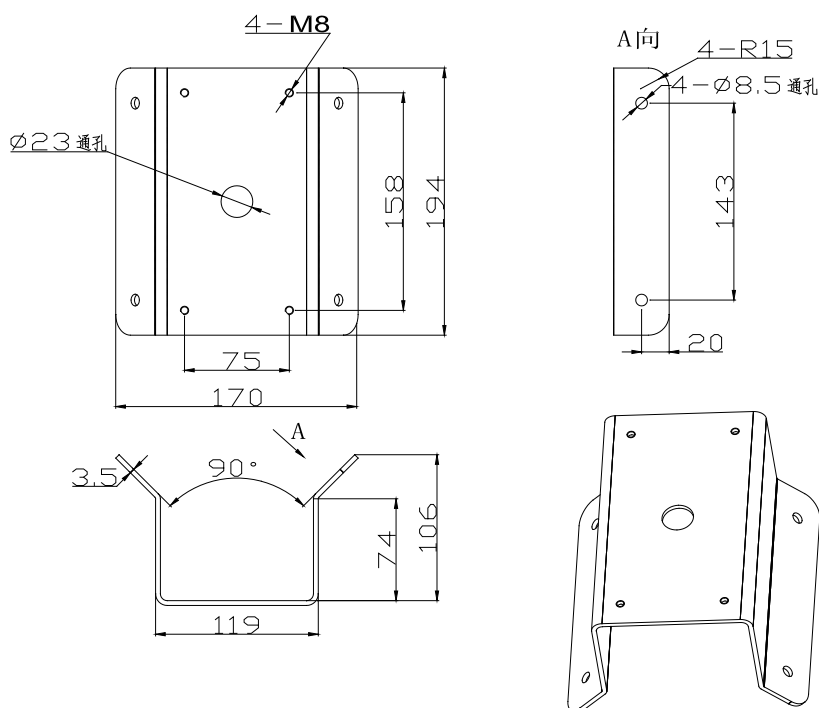


Wall mount with power supply box

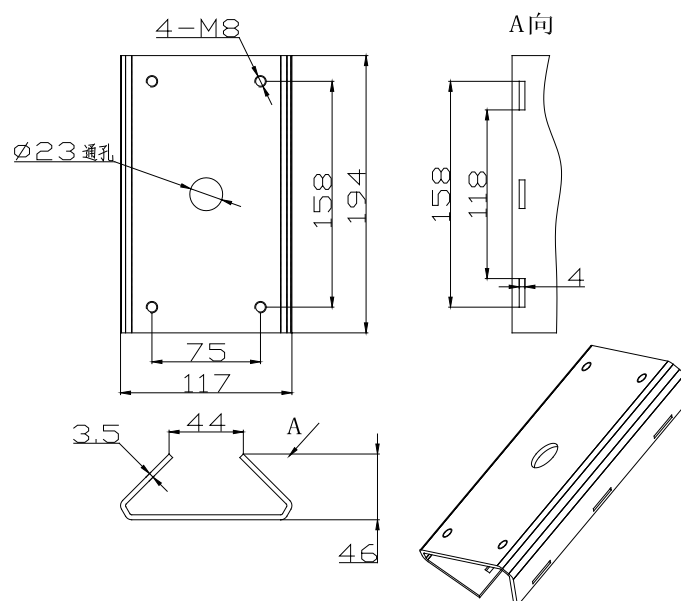
2.2 Short Wall Mount



2.3 Corner Mount



2.4 Pole Mount

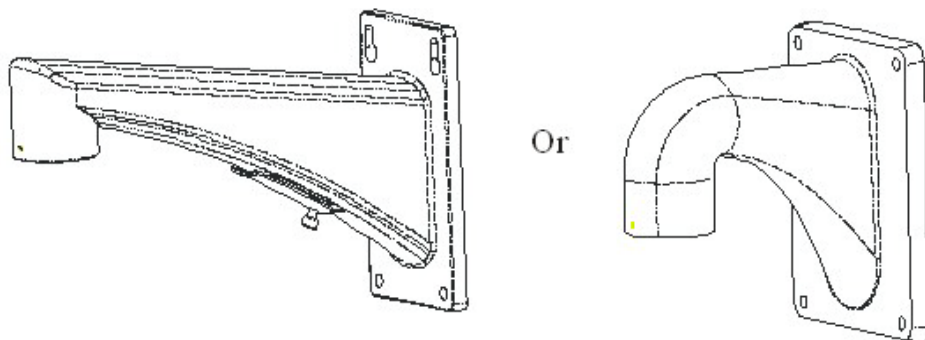


Chapter 3 Wall Mounting Applications

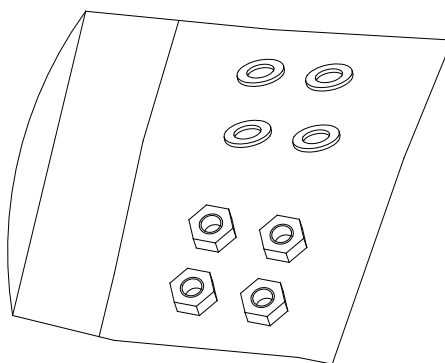
3.1 Mounting Components

- **Wall Mount**

Wall mounts are applicable to indoor/outdoor pendant domes.



- **Mounting Accessories**

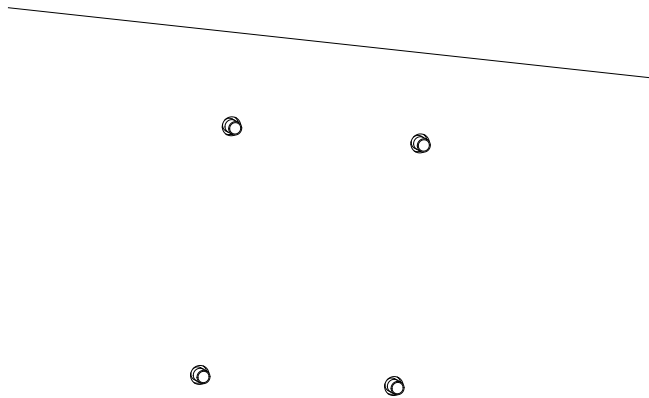


Nuts and Flat Washers

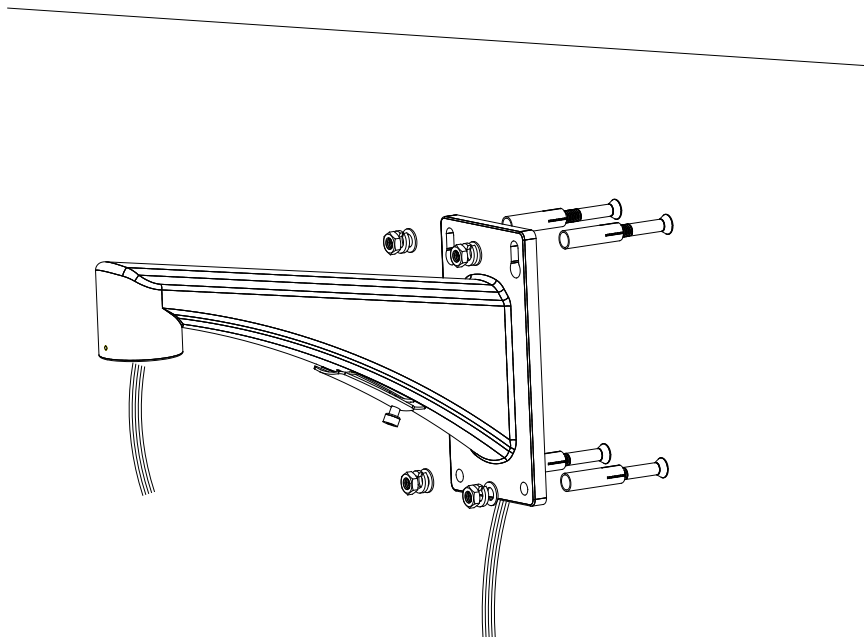
3.2 Wall Mounting Instructions

The wall mounting is applicable to the indoor/outdoor solid wall construction which should comply with the following mounting requirements:

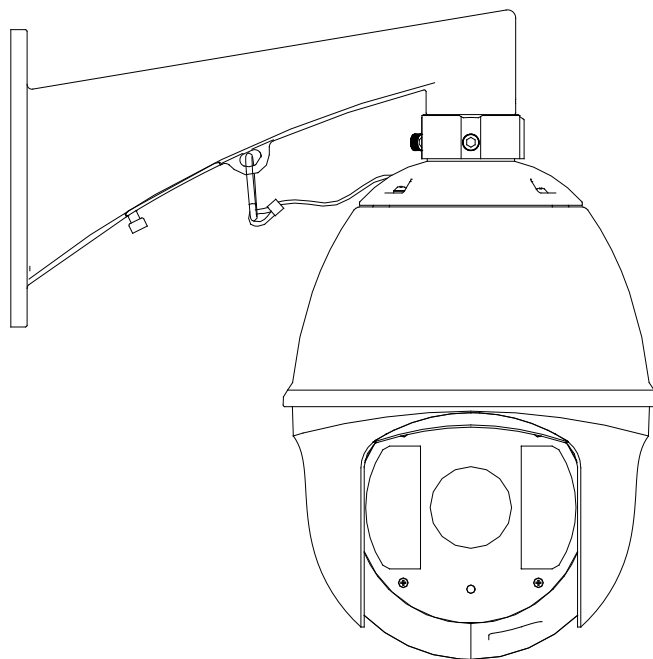
- The wall must be thick enough to install the expansion screws.
- The wall must be capable of supporting up to 8 times the total load of the dome and its accessories.

**Step1: Drill mounting holes in the wall and install the expansion screws**

Drill four holes in the wall according to the mounting locations, and then insert M6 expansion screws (not supplied) into the mounting holes.

**Step2: Secure the wall mount to the wall**

Drill four hex nuts padding with flat washers through the wall mount and rubber gaskets into the expansion screws.

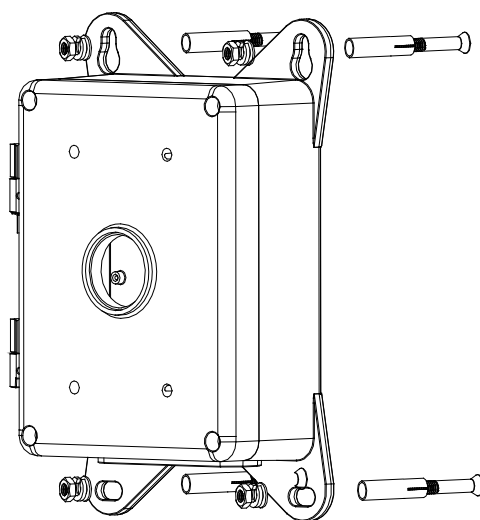
**Step3: Install dome to the mount**

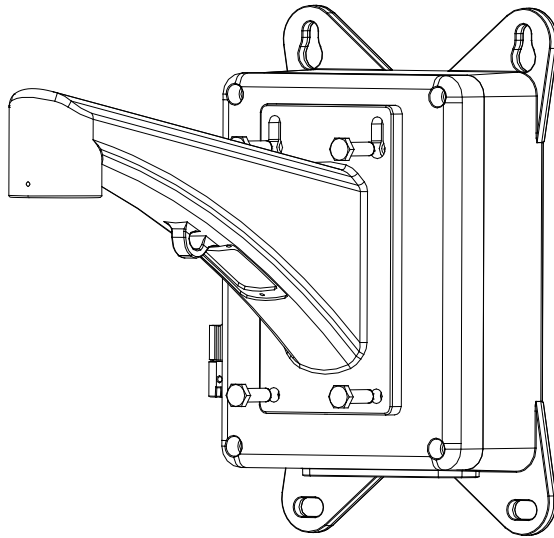
Pass cables through the opening on top of the back box, screw the pipe thread of the back box into the thread hole in the mount, and then use M3 screws to secure the dome. Refer to *Section 1.2* for installation instructions.

Note: Follow the same instructions described above for the Short Mount installation. For outdoor applications, please adopt the water-proof measures. The Short Mount is not recommended to be used for outdoor applications.

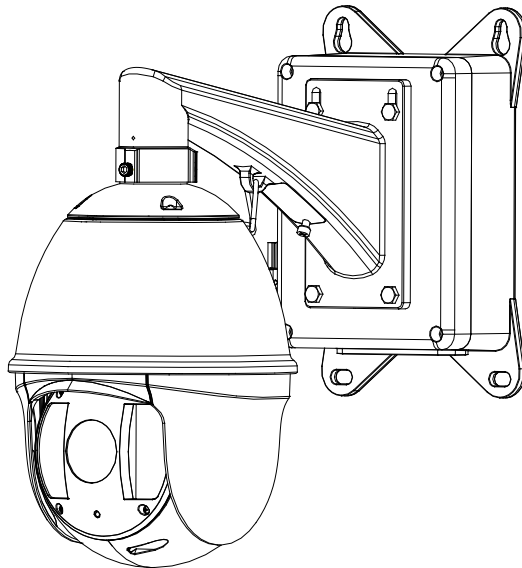
Wall mounting with the power supply box:**Step1: Drill holes, install the expansion screws and fix the power supply box**

Drill four holes in the wall according to the mounting locations, and then insert M10 expansion screws (not supplied) into the mounting holes. Secure the power supply box to the wall by using nuts and washers to tighten the four expansion screws.

**Step2: Secure the wall mount to the power supply box**



Step3: Install dome to the mount



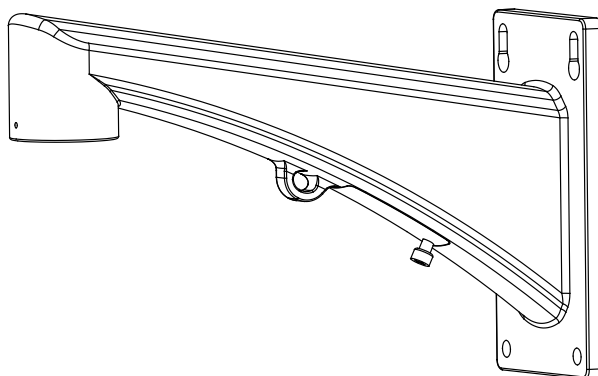
Note: Follow the same instructions described above for the Short Mount installation. For outdoor applications, please adopt the water-proof measures. The Short Mount is not recommended to be used for outdoor applications.

Chapter 4 Corner Mounting Applications

4.1 Mounting Components

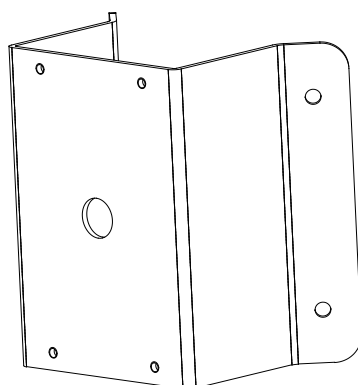
- **Wall Mount**

Wall mount is applicable to the indoor/outdoor pendant domes. It can be used together with corner mount, wall mount or pole mount.

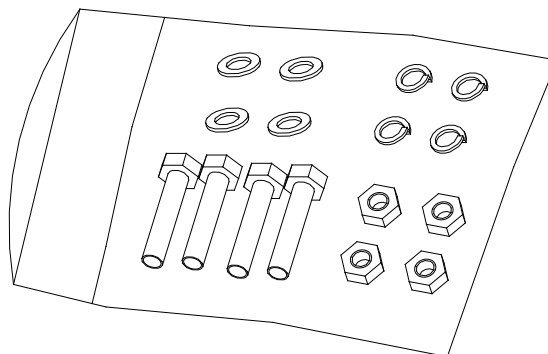


- **Corner Mount**

The corner mount must be used together with wall mount when it is fixed to the corner.



- **Mounting Accessories**

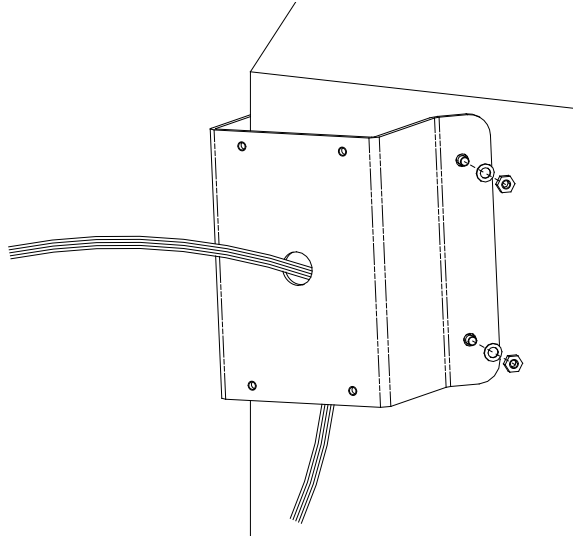


Hexagonal Screws (M8×30), Nuts, Spring Washers and Flat Washers

4.2 Corner Mounting Instructions

The corner mounting is applicable to the indoor/outdoor 90° solid corner construction which should comply with the following mounting requirements:

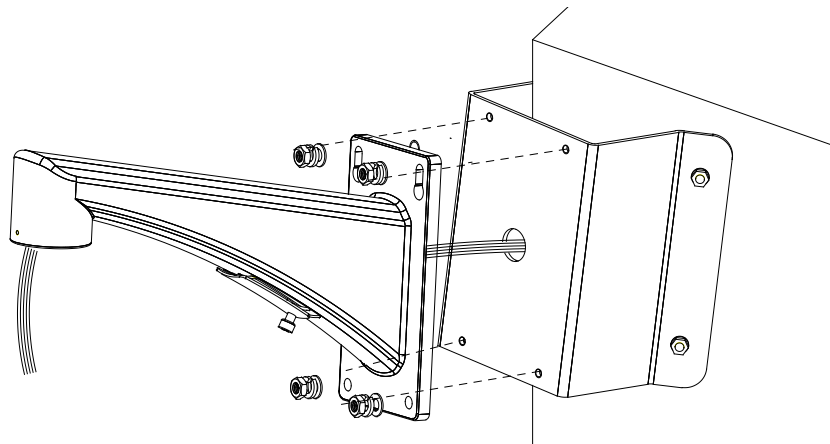
- The wall must be thick enough to install the expansion screws.
- The wall must be capable of supporting up to 8 times the total load of the dome and its accessories.



Step1: Install the corner mount

Drill four holes in the corner according to the mounting locations, and then insert M6 expansion screws (not supplied) into the holes. Pull the power cord, video cable and control line through the opening of the corner mount. Secure the corner mount to the corner by using nuts and washers to tighten the four expansion screws.

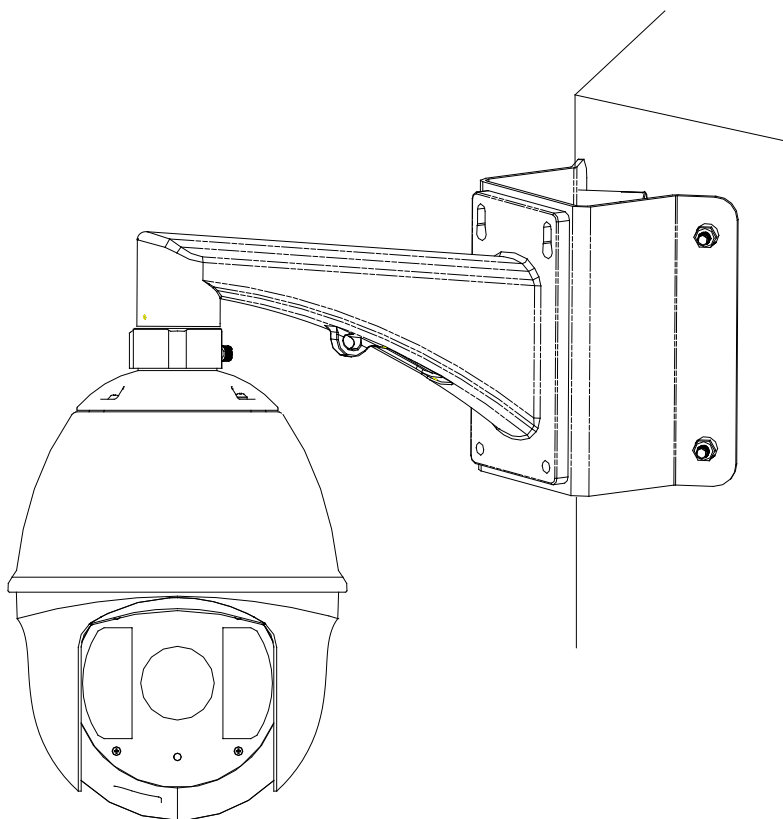
Note: Make sure the cables have enough length. For outdoor applications, please apply the **sealant** around the cable opening to prevent water.



Step2: Secure the wall mount to the corner mount

To fix the wall mount to the corner mount, screw 4 hexagonal screws with the spring washers through the wall mount and gaskets then into the corner mount.

Note: It is better to rotate the screw semicircle more after the spring washers have been compressed tightly so as to develop the **seal** function of gasket without damaging the screw thread.

**Step3: Install dome to the mount**

Pass cables through the opening on top of the back box, screw the pipe thread of the back box into the thread hole in the mount, and then use M3 screws to secure the dome. Refer to *Section 1.2* for installation instructions.

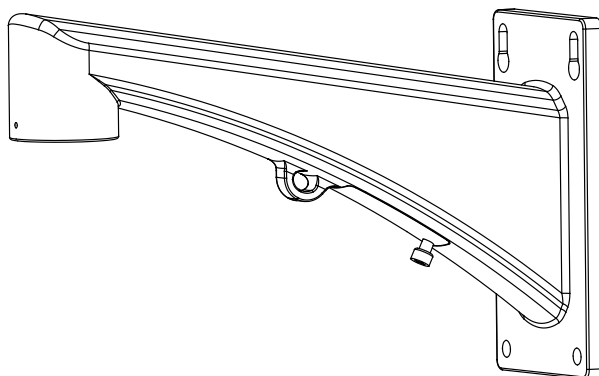
Note: Follow the same instructions described above for the Short Mount installation. For outdoor applications, please adopt the water-proof measures. The Short Mount is not recommended to be used for outdoor applications.

Chapter 5 Pole Mounting Applications

5.1 Mounting Components

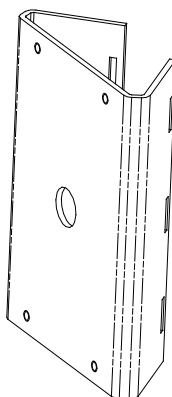
- **Wall Mount**

Wall mount is applicable to the indoor/outdoor pendant domes. It can be used together with corner mount, wall mount or pole mount.

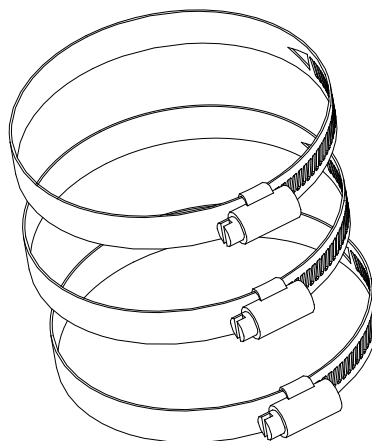


- **Pole Mount**

The pole mount must be used together with wall mount when it is fixed to the pole.



- **Pole Mount Hoop**

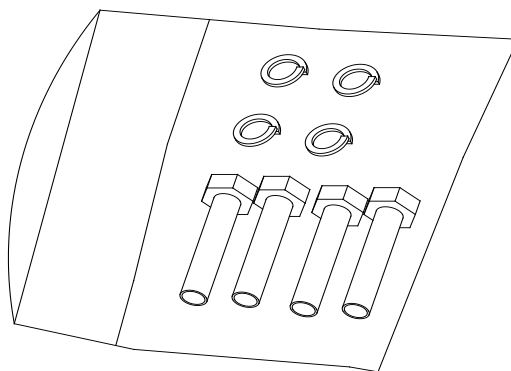


Pole mount hoop is used to cooperate with pole mount, with following dimensions selectable:

φ59-82mm, φ84-108mm, φ103-127mm, φ130-152mm, φ155-178mm, φ180-203mm, φ194-216mm;

Customized dimensions can also be provided according to user's demand.

- **Mounting Accessories**

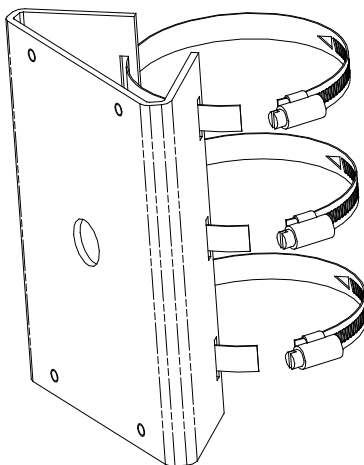


Hexagonal Screws (M8×30) and Spring Washers

5.2 Pole Mounting Instructions

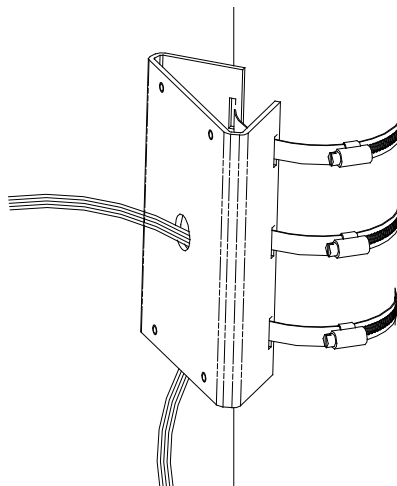
The pole mount is applicable to the indoor/outdoor solid pole construction which should comply with the following mounting requirements:

- The diameter of pole must fit the mounting dimension of the pole mount hoop.
- The pole must be capable of supporting up to 8 times the total load of the dome and its accessories.



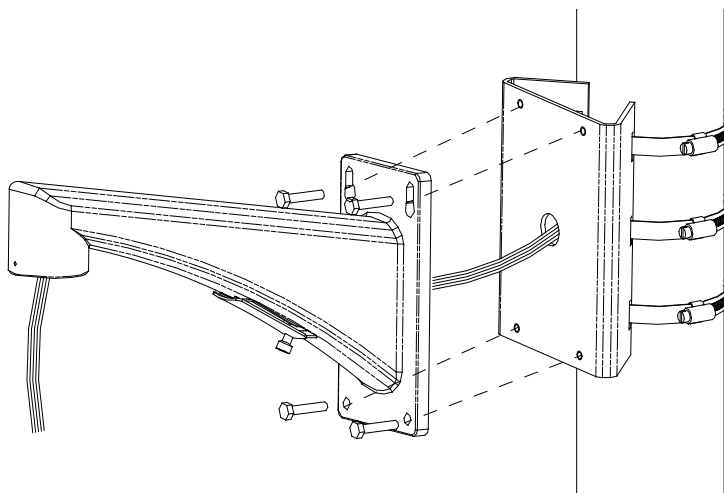
Step1: Assemble the pole mount and pole mount hoop

Use a **screwdriver** to loosen the three pole mount hoop and then insert them through the rectangle holes on the pole mount.

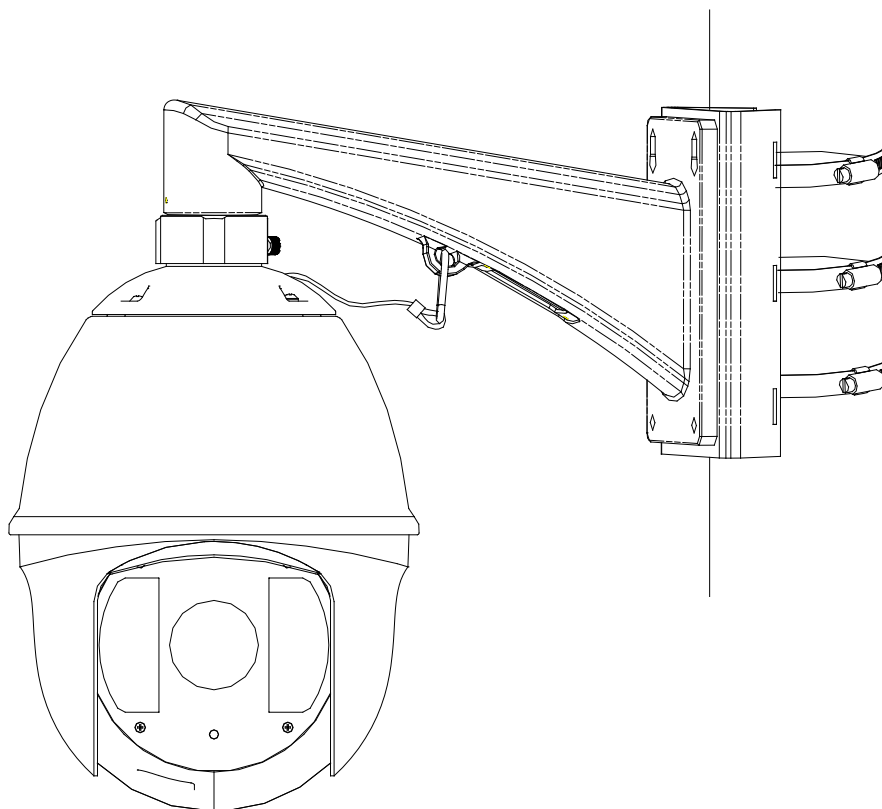
**Step2: Install pole mount**

Pull the power cord, video cable and control line through the opening of the pole mount. Open the hoops and clip them to the pole. Then close the hoops and screw the screws tightly.

Note: For outdoor applications, please apply the **sealant** around the cable opening to prevent water.

**Step3: Install wall mount to pole mount**

Screw 4 hexagonal screws with the spring washers through the wall mount and gaskets then into the pole mount.

**Step4: Install dome to the mount**

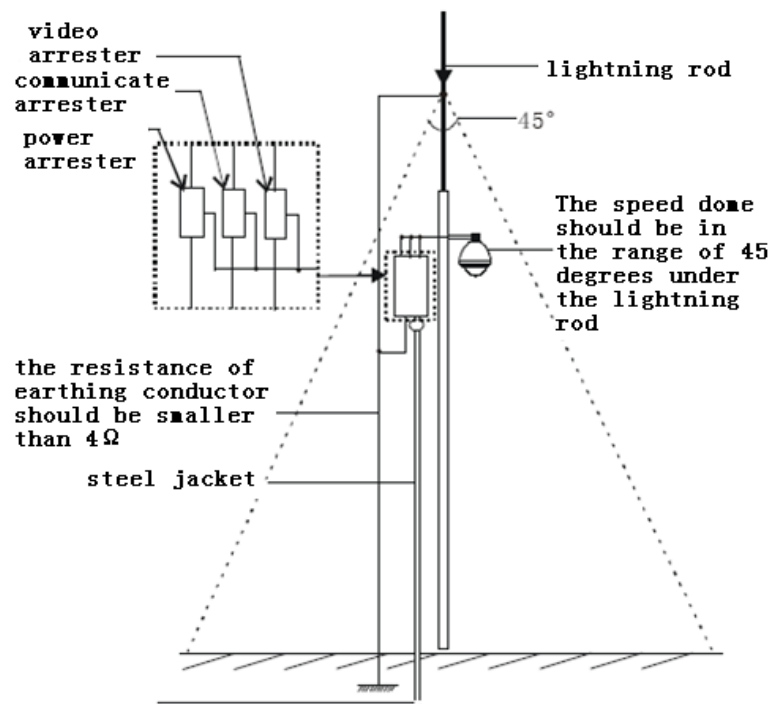
Pass cables through the opening on top of the back box, screw the pipe thread of the back box into the thread hole in the mount, and then use M3 screws to secure the dome. Refer to *Section 1.2* for installation instructions.

Note: Follow the same instructions described above for the Short Mount installation. For outdoor applications, please adopt the water-proof measures. The Short Mount is not recommended to be used for outdoor applications.

Appendix 1 Lightning & Surge Protection

This product adopts TVS plate lightning protection technology to avoid damage caused by pulse signal that is below 3000W, like instantaneous lighting, surging, etc. According to the actual situation outdoors, necessary protection measures must be taken to secure the electrical safety.

1. The distance between signal transmission line and High-voltage equipment or high-voltage cable is at least 50m.
2. Outdoor wiring should better be along the eaves as much as possible.
3. In the open field, wiring should be buried underground in sealed steel pipe, and the steel-pipe should be one-point grounding. Overhead routing method is forbidden.
4. In strong thunderstorm area or high induction voltage areas (such as high-voltage transformer substation), high power lightning protection apparatus and lightning conductor are necessary to be appended.
5. The design for installation and wiring with lightning protection and grounding in mind should be combined with the lightning protection consideration of the building, and conform to the related national standards and industry standards.
6. The system should be equipotentially grounded, and the grounding equipment must satisfy double-request of system anti-jamming and electric safety, and it must not appear short circuit and open circuit with the zero conductor of strong grid. When the system is grounding individual, the resistance should be no more than 4Ω , the section al area of the grounding cable should be no less than 25mm^2 . For grounding instructions, please refer to the *Installation Manual of Speed Dome*.



Appendix 2 RS485 Bus Connection

1. General Property of RS485 Bus

According to RS485 industry bus standard, RS485 is a half-duplex communication bus which has 120Ω characteristic impedance, the maximum load ability is 32 payloads (including controller device and controlled device).

2. RS485 Bus Transmission Distance

When using 0.56mm (24AWG) twisted-pair line, according to different baud rate, the max transmission distance theory table is shown as below:

Baud Rate	Max Distance
2400BPS	1800m
4800BPS	1200m
9600BPS	800m

The transmission distance will be decreased if we use the thinner cable, or use this product under the strong electromagnetic interference situation, or there are lots of devices are added to the bus; on the contrary, the transmission distance will be increased.

3. Connection Method and Terminal Resistance

RS485 industry bus standard require daisy-chain connection method between any devices, both sides have to connect a 120Ω terminal resistance (show as Diagram 1), the simplified connection method is shown as diagram 2, but the distance of “D” should not be too long.

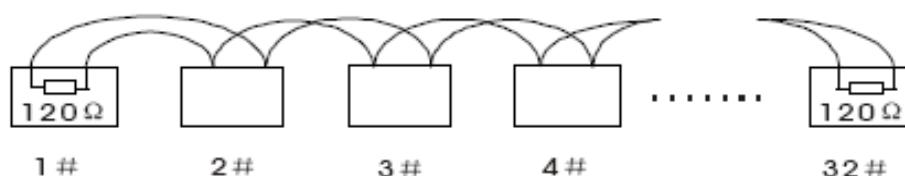


Diagram 1

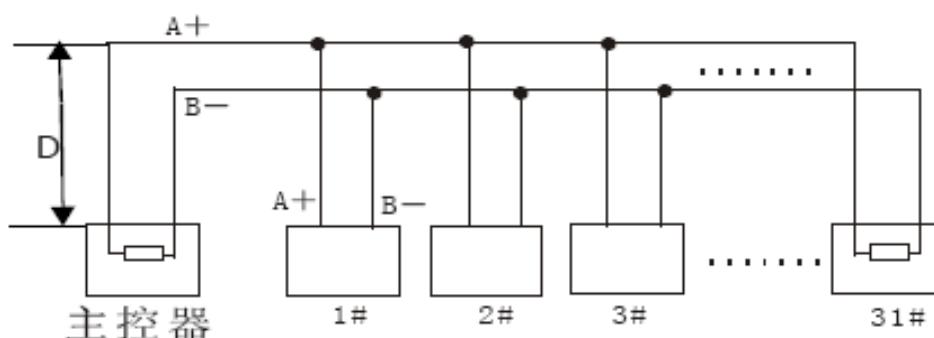


Diagram 2

2) Connection of 120Ω terminal resistor

The 120Ω terminal resistor can be connected through the DIP switch on the communications board, as shown in Figure3. For a new dome, the 120Ω matching resistor is defaulted as unconnected, switch on the eighth bit of SW2, it will be connected. Conversely,

switch off the eighth bit of SW2, it will be unconnected.

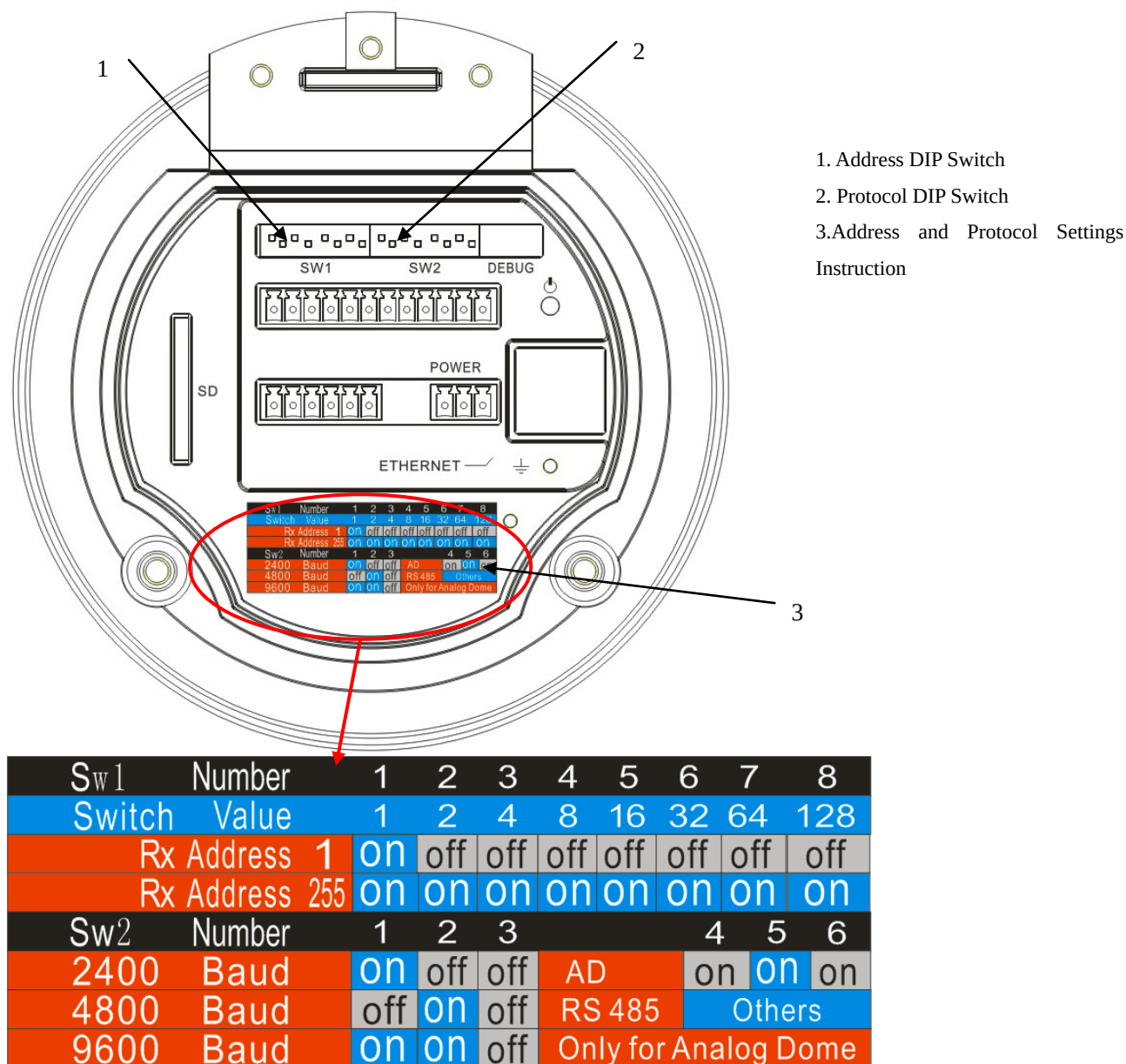


Figure 3

4. Problems in the Practical Application

Normally, users adopt star-shape connection method in construction, under this situation, the terminal resistors must be connected between two farthest devices (as Figure 4, 1# and 15#), but this connection method is not satisfy the requirement of the RS485 industry standard so that it will lead to some problems such as signal reflection, anti-jamming ability decline when the devices are faraway. At this time, the dome will be uncontrollable, or self-running, etc.

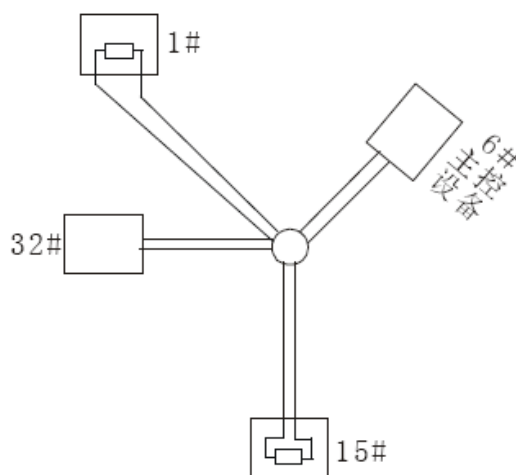


Figure 4

For such case, the best way is adding a RS485 distributor. This product can effectively change the star-shape connection to which satisfies the requirement of RS485 industry standard, in order to avoid those problems and improve the communication reliability. Show as figure 5.

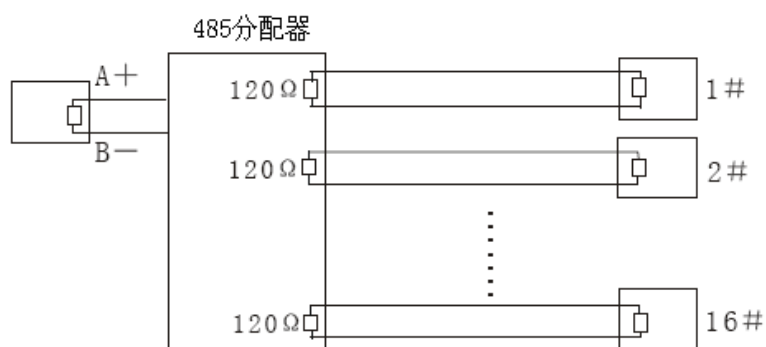


Figure 5

1. FAQ of RS485 Bus

Fault Phenomenon ^⓪	Probable Cause ^⓪	Solutions ^⓪
The speed dome do the self-check but can not be controlled. ^⓪	1. The address or Baud Rate is not matched between Host and the Speed Dome. ^⓪	1. Adjust the address or Baud Rate of Host or Speed Dome to make a match. ^⓪
	2. RS485+, - are connected incorrectly. ^⓪	2. Change the RS485+ and RS485- wires. ^⓪
	3. Wiring drops, ^⓪	3. fastening the wire ^⓪
	4. RS485 wire broke, ^⓪	4. Change RS485 wire. ^⓪
The speed dome can be controlled but not smoothly ^⓪	1. loose contact of RS485 ^⓪	1. fastening RS485 wire, ^⓪
	2. one RS485 wire broke, ^⓪	2. Change RS485 wire. ^⓪
	3. Host and speed dome are too far away ^⓪	3. Add terminal matched resistance ^⓪
	4. Too many speed domes are connected ^⓪	4. Add RS485 distributor ^⓪

Appendix 3 Table of Wire Gauge Standards

Bare Wire Gauge (mm)	American Wire Gauge AWG	(British) Standard Wire Gauge SWG	Cross-sectional Area of Bare Wire mm
0.050	43	47	0.00196
0.060	42	46	0.00283
0.070	41	45	0.00385
0.080	40	44	0.00503
0.090	39	43	0.00636
0.100	38	42	0.00785
0.110	37	41	0.00950
0.130	36	39	0.01327
0.140	35		0.01539
0.160	34	37	0.02011
0.180	33		0.02545
0.200	32	35	0.03142
0.230	31		0.04115
0.250	30	33	0.04909
0.290	29	31	0.06605
0.330	28	30	0.08553
0.350	27	29	0.09621
0.400	26	28	0.1257
0.450	25		0.1602
0.560	24	24	0.2463
0.600	23	23	0.2827
0.710	22	22	0.3958
0.750	21		0.4417
0.800	20	21	0.5027
0.900	19	20	0.6362
1.000	18	19	0.7854
1.250	16	18	1.2266
1.500	15		1.7663
2.000	12	14	3.1420
2.500			4.9080
3.00			7.0683